



Disaster and Emergency Management Resources

Introduction to Landslides and Mudflows

Landslides occur when masses of rock, earth, or debris move down a slope. Landslides may be very small or very large, and they can move at slow to very high speeds. Landslides are typically associated with periods of heavy rainfall or rapid snowmelt and tend to worsen the effects of flooding that often accompanies these events. In areas burned by forest and brush fires, a lesser amount of precipitation may initiate landslides.

Mudflows are rivers of rock, earth, and/or other debris saturated with water. They develop when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt, changing the earth into a flowing river of mud or "slurry." They usually start on steep hillsides as shallow landslides that liquefy and accelerate to speeds that are typically about 10 miles per hour but can exceed 35 miles per hour. The consistency of debris flows ranges from watery mud to thick, rocky mud that can carry large items such as boulders, trees, and cars.

Landslides and Mudflow Facts

- Landslides are a serious geologic hazard common to almost every state in the United States. It is estimated that nationally they cause up to \$2 billion in damages and from 25 to 50 deaths annually.
- Landslides and mudflows usually strike without warning. The force of rocks, soil, or other debris moving down a slope can devastate anything in its path.
- Acres of property may be damaged and buildings and homes destroyed by landslides. Landslides can provoke associated dangers such as broken electrical, water, gas, and sewage lines and can disrupt roadways and railways.
- Landslide warning signs include cracks opening on hillslopes; evidence of slow, downhill movement of rock and soil; and tilting of trees, poles, or walls.
- Landslide, mudflow, and debris-flow problems are often caused by land mismanagement. Improper land-use practices on ground of questionable stability, particularly in mountains, can create and accelerate serious landslide problems.
- Mudflow is covered by flood insurance policies from the National Flood Insurance Program. Landslides are not.

Adapted from resource material developed by the Federal Emergency Management Agency